

Application No.: 10/776852
Amendment dated: August 27, 2004
Reply to Office action of June 18, 2004

REMARKS/ARGUMENTS

Claim 1 has been amended by incorporating into it the limitations of claim 2, and claim 2 has been cancelled.

Claims 1 and 2 were rejected on Shimano and Okui substantially on the same grounds. Both show dual cam engines in which power is transmitted from a crankshaft to a first cam through a crank-to-cam chain, and from one camshaft to another through a cam-to-cam chain. Okui shows a timing drive configuration similar to that of the present invention. It was the examiner's position that it would have been obvious to design the strength/pitch of the chains in Shimano and Okui, depending on their loading requirements.

The applicant concedes that making Shimano's and Okui's cam-to-cam chains only as strong as necessary would have been obvious. On the other hand, making the pitch of a cam-to-cam chain smaller than the pitch of the crank-to-cam chain in the same engine is not quite so obvious.

There is no teaching in Shimano, or in Okui, that the pitch of a cam-to-cam chain should be different from that of a crank-to-cam chain.

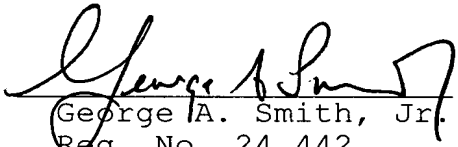
In Shimano et al., the crankshaft sprocket diameter is slightly smaller than the diameter of each of the cam-to-cam drive sprockets. In Okui, the camshaft sprocket diameter is approximately equal to the diameter of the cam-to-cam drive sprockets. In both cases, therefore, in selecting suitable sprockets and a suitable drive chain for the cam-to-cam drive, the obvious choice is to adopt a chain that is identical to the crank-to-cam drive chain in all respects, except its length (and possibly its strength), and to adopt a pair of cam-to-cam drive sprockets suitable for use with that chain.

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As pointed out by the examiner, the selection of optimum ranges is generally considered a matter of routine skill. Thus, especially in the case of Shimano, where a single crank-to-cam chain supplies power to four cams, it might occur to a designer having ordinary skill that the cam-to-cam chains need not be as strong as the crank-to-cam chain. However, the optimum drive, insofar as Shimano et al. and Okui et al. are concerned, is one in which the cam-to-cam chain has the same pitch as the crank-to-cam chain. Nothing in either reference suggests the applicant's departure from Shimano and Okui, namely the selection of a cam-to-cam chain that has a pitch smaller than that of the crank-to-cam chain. That feature, as now defined in the amended version of claim 1, is not shown to have been obvious by the prior art.

Favorable reconsideration and allowance of this application is therefore respectfully requested.

Respectfully submitted,
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